Innovative Optronics Instrumentation

Duma Optronics was established in 1989 by a group of entrepreneuring researchers to serve the optronics instrumentation market with innovative products.

The 15 person R&D group includes specialists in optical design, E-O systems, electronic signal processing and computerized imaging. Their fertile interaction resulted in a number of innovative solutions to optronics instrumentation problems with universal applications.

As can be judged From this product sample, the Duma Optronics strength lies in combining:

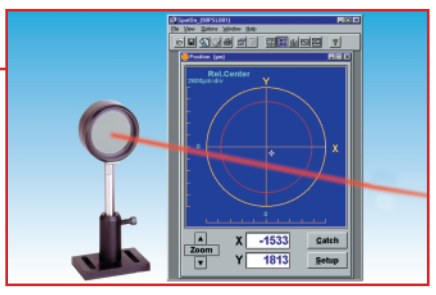
- A wide spectrum of technical disciplines
- A strong spirit of innovation
- A practical, application-oriented approach to High-Tech.

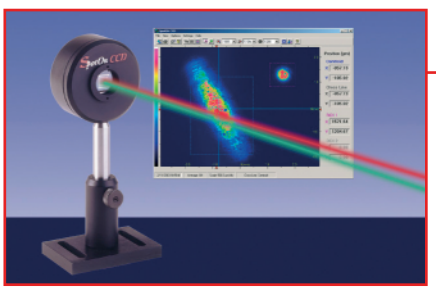
The unique state-of-the-art technology developed and owned by Duma Optronics is under patent pending.

We offer a wide variety of computerized measurement systems, providing more sophisticated and cost-effective solutions to numerous applications.

DUM SPOT L44
Beam Positioning Measurement

Monitors beam position and power using a large detection area. Based on a Lateral Effect detector for the VIS range. Plug-in type device which handles one or two PSDs simultaneously.



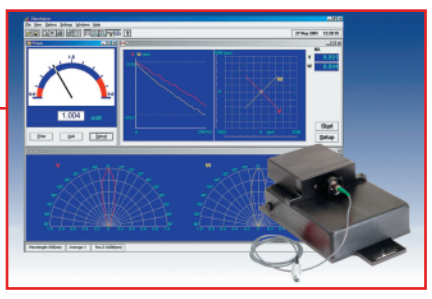


SpotOn CCD USB 2.0 NEW
Multiple Beam Positioning

Measures both CW and pulsed beams, up to 3 beams simultaneously. Wide spectral range, from UV through IR. High accuracy measurement, less than 5μm deviation edge-to-edge and sub-micron resolution for minute movements. PCI / USB 2.0 interface

FiberAlyzer NEW
Goniometric Radiometer for diode/fiber analysis

A characterization instrument for the angular radiation intensity of light. The device measures N.A., power, angular width ratio and angular position with respect to the optical axis.



FiberPower NEW
Simultaneous Measurements of Optical Power

A multi-channel optical power meter for CW beams for the near infrared. Compare between channels and get information on attenuation, stability, long term performance and Pass/Fail testing.

M² Beam
M² Measurement System

Multi-function device, measuring the 2-axis M² figure of CW lasers, waist size and its location. The M² factor is measured in accordance with the proposed ISO standard ISO/CD11 146.

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1st Hazait St., P.O.Box 3370 Nesher 20306, Israel Tel:972-4-8200577 Fax: 972-4-8204190
Website:http://www.duma.co.il E-mail:sales@duma.co.il

Innovative Optronics Instrumentation

Our entrepreneuring researchers have broaden the area of applications into new Optronics Instrumentation and now offering innovative products for the communication industry.

QC of laser beams and optical systems, alignment of laser beams, multiple beam positioning and power measurement for WDM/DWDM, laser diode/fiber optic far-field angular radiation, collimation measurements. On-line monitoring of beam characteristics.

Complete test stations for the fiber optics and optronics markets.

By using fast analog electronics and signal processing a new breed of fast positioning instrumentation is now available. Responding to the increasing demand and challenging new micronic laser beams, a practical and application oriented instrument for micronic beams was developed, and is offered for both the visible and IR markets.

The unique state-of-the-art technology enables simultaneous measurements of multiple parameters, such as : the AlignMeter system, where positional and angular beam deviations are measured and displayed, or the OctaPower system measuring up to 8 power channels simultaneously.

Following our expertise and innovation spirit we provide you with a practical application-oriented approach for your measurement needs.

AlignMeter
Optical Beam Alignment

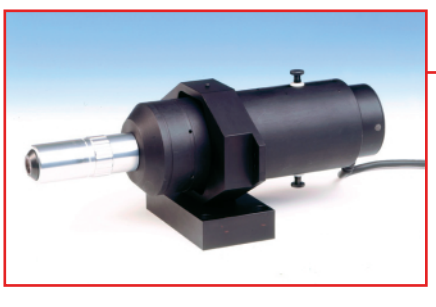
Simultaneous measurements of Position and Angular displacements. Position accuracy down to 1 μm and Angular accuracy down to μRad. Offered as plug-in type device (ISA/PCI/PCMCIA) or as a Stand-Alone instrument.

SpotOn Analog NEW
Fast Beam Positioning

Measures position and power of a Lateral Effect PSD, resolution down to 1 μm. Fast (up to 60 KHz bandwidth) and compact design. Also offering an A/D board and a receiving program under Windows for fast digital positioning applications.

OctaPower
Multi Channel Power Meter

Measures CW optical power of lasers & laser diodes, up to 8 channels simultaneously, using either Si detectors , InGaAs detectors with fiber optic attachments, or UV-Enhanced detectors. Powerful device enabling math operations and comparisons between measuring channels.



µBeam NEW
Microscopic Beams Analyzer

Measures microscopic beams of less than 0.5 μm, both CW or pulsed beams. A wide spectral range is available. Offered as a plug-in type device (PCI) or as a Stand Alone unit which is perfect for an industrial environment.

FocusGage
Depth-of-Focus & Divergence

Measures the 2-axis depth-of-focus, beam waist size and location, divergence (N.A.) of CW lasers. Based on Si , UV-Enhanced or InGaAs detector heads. Offered with a Stand Alone self contained instrument.

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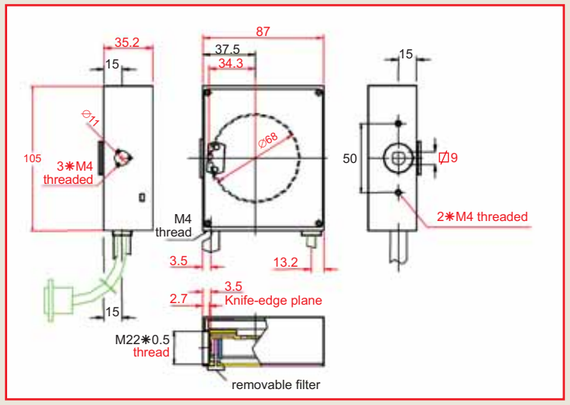
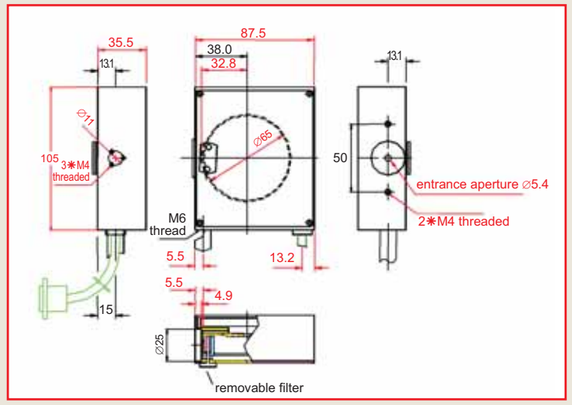
Specifications

BA7 Head Drawing



BA3 Head Drawing



Dimensions are in mm

Sensor type	Silicon (Si), UV-Silicon (UV-Si) or InGaAs (IR)
Wavelength range	**Si** 400-1100nm **UV-Si** 190-1100nm **IR** 800-1800nm
Number of blades	3 for BA3 heads, 7 for BA7 heads
Beam size range	
3µm-5mm	for BA3-Si and BA3-UV
15µm-10mm	for BA7-Si and BA7-UV (Oval)
15µm-9mm	for BA7-Si and BA7-UV (Round)
3µm-3mm	for BA3-IR3
15µm-3mm	for BA7-IR3
3µm-5mm	for BA3-IR5
15µm-5mm	for BA7-IR5
Beamwidth resolution	1µm for beams>100 µm in size, 0.1µm for beams<100µm in size
Beamwidth accuracy	±2%
Power accuracy	±5% for Si and UV-Si heads, ±10% for InGaAs heads
Power range	10µW to 1W with filters for Si and UV-Si heads, 10µW to 5mW (no filters provided) for the InGaAs heads
Saturation	0.1 W/cm² without filter, 20W/cm² with NG9 (Si and UV-Si)
Power resolution	0.1µW
Position accuracy	±15µm
Position resolution	1µm
PC interface	½ size P&P PCI card
Temperature	-10º to 50ºc
Sensor head weight	755 Gram with cable
Measurement rate	5Hz
CE Compliance	

Host Computer Requirements

Pentium III, 128MB RAM, 10MB Free HDD, 8 MB 16 bit VGA card, CD ROM any type, 1 free ½ size PCI slot,
OS: Windows 98/ME/NT 4.0/2000/XP

Ordering Information

The system consists of a measuring head with 2.5m long attached cable, a post, ½ length PCI card, NG4 and NG9 filters in housing (for Si and UV-Si heads), software on CD disk, carrying case.

BA3-Si	3-blades, Si detector 5mm circular
BA7-Si	7-blades, Si detector 9mm square
BA3-UV	3-blades, UV-Si detector 5mm circular
BA7-UV	7-blades, UV-Si detector 9mm square
BA3-IR3	3-blades, InGaAs detector 3mm circular
BA7-IR3	7-blades, InGaAs detector 3mm circular
BA3-IR5	3-blades, InGaAs detector 5mm circular
BA7-IR5	7-blades, InGaAs detector 5mm circular

Optional Accessories

BA-Fiber	A fiber adapter with an FC connector designed to fit onto the aperture of the BA head close to the knife-edge aperture.
BA-Mount	An optional mount is available to enable rotation of the BA head about the Optical axis. The mount has 360 degree calibrated scale with locking screw.

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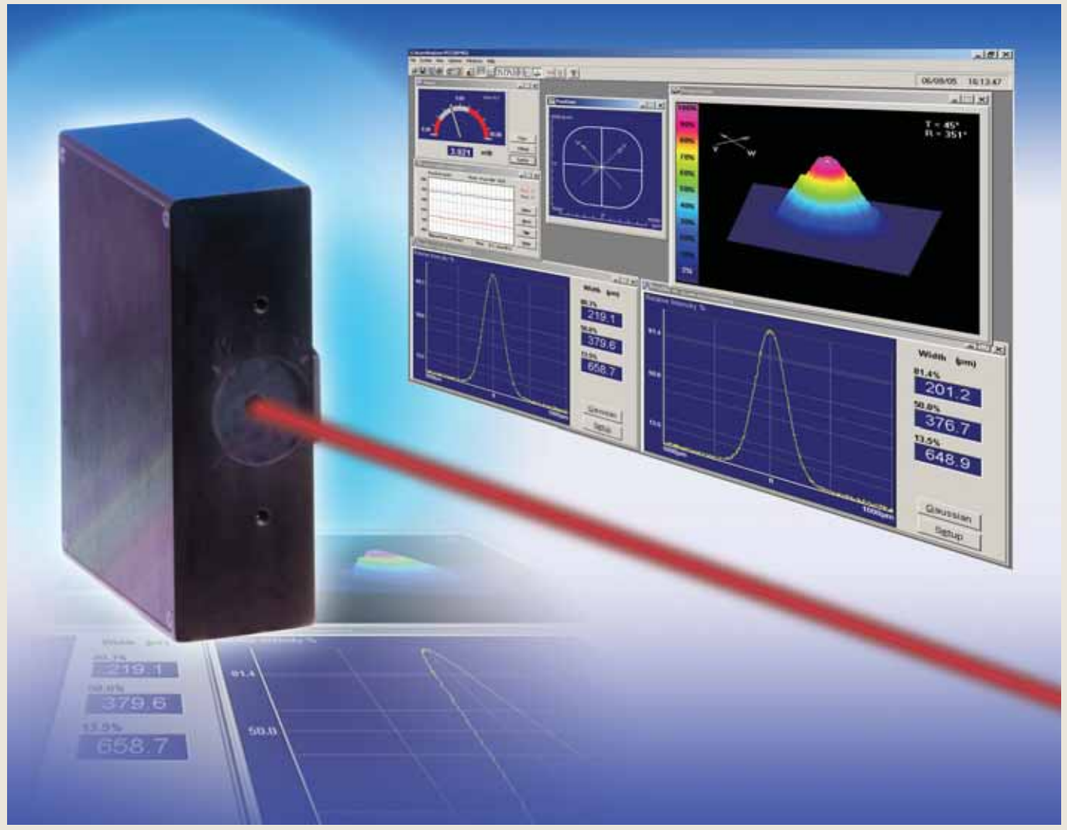
Beam Analyzer

Multiple Scanning Knife-Edge Beam Profiler



High precision beam diagnostics for CW lasers

- **Patented technology:** Unique tomographic image reconstruction of 2D/3D images
- **Versatile:** Meaure beam profile, beam size, beam shape, position and power
- **Flexible:** Wide spectral range, from 190nm through 1800nm
- **Accurate:** Beam sizes from 3µm to 9mm with 0.1µm resolution
- **Compact:** Based on a PCI card, measuring head, software

Main Software Features

- Real time beam profiles, beam size and gaussian fit
- 2D/3D plots of beam in real time
- Beam centroid and ellipticity, Power measurement
- Direct data logging to Excel files
- Data streaming via RS232 or TCP/IP
- Save image and snapshot files
- Automatic Pass/Fail analysis report
- ActiveX software for integration in user's program

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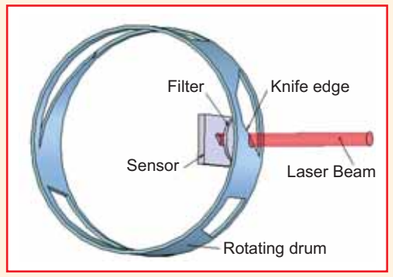
Patented Technology

The Beam Analyzer provides a bridging technology, producing the 3D intensity reconstruction of CCD cameras, while being capable of measuring very small spots at high resolution and huge dynamic range

The measuring technique is based on a multiple scanning knife-edge technology, combined with a tomographic image reconstruction for the creation of the 2D/3D display. When the drum spins, the knife-edges cut across the beam in an orthogonal plane to the direction of propagation. A stationary large detector inside the spinning drum measures light intensity. For attenuation, when needed, a built-in distortion free optical filter is inserted between the spinning drum and the detector. This technique provides the required attenuation without affecting beam quality. Each scanning knife-edge is oriented at a different angle on the drum and moves across the beam path in a different direction as the drum rotates. Consequently, during a single rotation of the drum, the instrument generates a set of profile curves, each representing the intensity profile of the beam from a different direction. This data is the input for the tomographic reconstruction algorithm to generate the 2D/3D intensity profile of the beam.

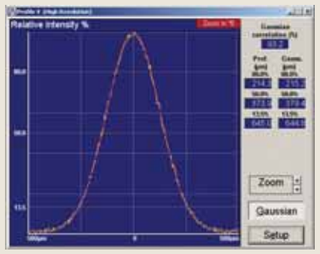
The ***Beam Analyzer*** is offered in two types of measuring heads: The BA7 uses seven individual knife-edges, providing more accurate measurement of the true beam shape and dimensions by gathering data from all 7 scans, while the BA3 uses only three knife-edges, and is recommended for smaller beams measurement as well as for a near-Gaussian beams. The more knife-edges, the greater the level of detail obtained. For a beam distribution that is significantly non-Gaussian the BA7 would reconstruct a plot that closely matches the real beam.



System Presentations

Beam Analyzer provides an extensive range of graphical presentations and analysis of laser beam parameters.

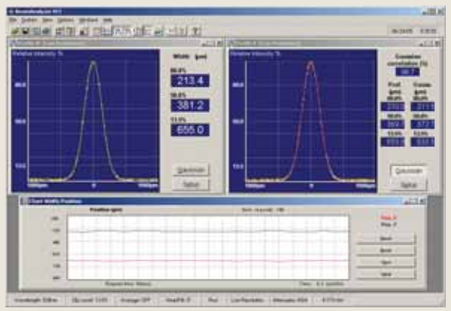
Beam Profiles and Width



Beam Analyzer' control software simultaneously displays two profiles from two orthogonal knife-edges, or show each profile individually for greater visual detail. These main profiles, located at 45 degrees from the base of the head, are called "V" and "W".
Beam widths are digitally displayed for any three user selected clip levels, with up to 0.1µm resolution. The beam profile displays are auto-scaled (optional) to maximize on-screen detail and resolution. Added detail can be obtained in a special high-resolution mode. A Gaussian fit profile can be overlaid on profiles in real time, while the correlation and fit values are displayed digitally. Zoom function automatically increases the displayed spatial resolution.

Chart mode

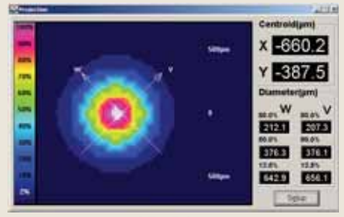
It is frequently necessary to monitor the Beam Width (or alternatively Beam Position) as a function of time. In Chart Mode, these parameters can be viewed in strip chart format, showing long term time-dependent stability or drift. The measured data can be viewed on screen, saved or printed for further analysis.



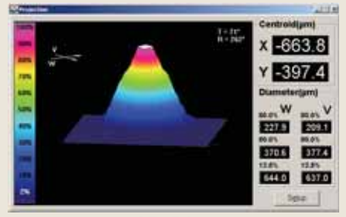
System Presentations (cont.)

2D and 3D Intensity Plots

The Projection function provides either a 2D or a 3D plot of the beam intensity profile, and is created using reconstructive tomography.
The 2D contour maps and the 3D isometric plots can be displayed with or without scan axis and grids. These plots can be rotated along the beam optical axis, as well as be flipped. This feature enables the user to view the image from various angles around the beam. It is also possible to control the 3D plot wire density.
Data about the beam size and centroid position is displayed digitally along with centroid and beam size data.



2D Plot

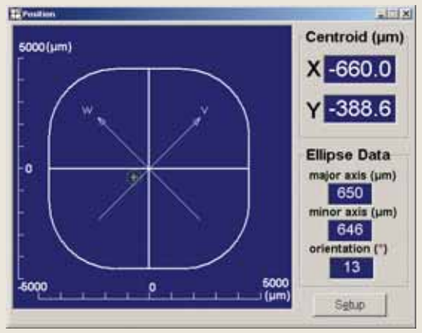


3D Plot

Power Measurement

The beam power can be displayed either as a digital readout, or as a bar-type display or in combination with an analog "needle". Power presentation units can be chosen as mW, µW or dBm. The user can offset the zero to deactivate the ambient light suppression. Pre-defined filter transmission files can be selected. A test range can be defined and displayed to monitor beam power within specific limits, audio alarms are optional.

Beam Position and Ellipticity

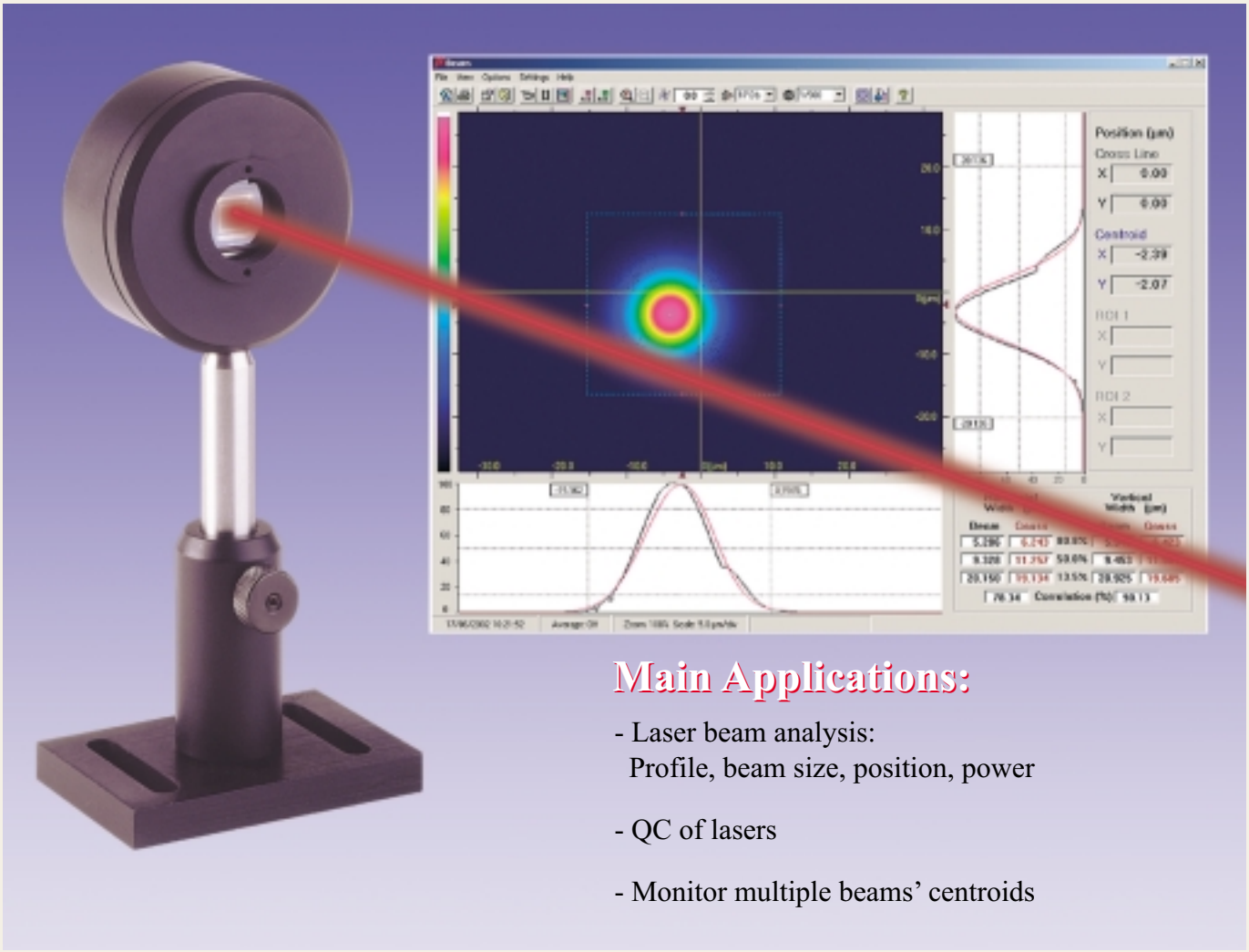


The beam centroid position is continuously monitored relative to the center of the sensor area in real-time, along with beam shape, ellipticity (major and minor axes) and angular orientation. A zoom function is available for viewing the footprint of small beams more clearly.
Observing beam position stability versus time is available upon setting up of the Chart function to monitor beam position at the selected clip level.

More Software Features

- Pass/Fail testing can be performed on measured results for acceptance within specific tolerances.
- Data logging to a Text file or to Excel file
- Live Snapshot files replay for complete analysis of results
- Average setting, Zooming
- TCP/IP communication protocol and remote control
- Data transmission via RS-232 link to another computer
- Slave Mode controlling the measurements upon request
- Screen images can be saved as BMP/JPG files or printed out
- ActiveX software for integration in user's application program

BeamOn CCD Beam Profiler



Main Applications:

- Laser beam analysis:
  Profile, beam size, position, power
- QC of lasers
- Monitor multiple beams' centroids

Expanding your profiling capabilities

- **Patented technology:** Wide dynamic range enabled by double sampling technology
- **Versatile:** A complete test station, measures both CW and pulsed beams
- **Flexible:** A wide spectral response from deep UV (190nm), VIS and up to 1550nm
- **Portable:** Based on a USB 2.0 attachment for notebooks, or on a PCI card
- **Easy to use:** user-friendly software, on-line help routine

Main Software Features

- Real time beam size and gaussian fit
- 2D/3D plots of beam in real time
- Software controlled electronic shutter & gain
- Video with playback, snapshot files
- Data exporting to another computer via RS232
- Data logging with detailed statistics
- ActiveX package to control software from your application
- Automatic Pass/Fail analysis report

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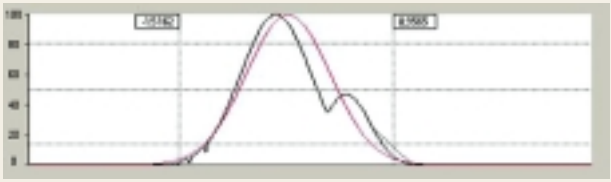
System Presentations

BeamOn provides an extensive range of graphical presentations and analysis of laser beam parameters.

Beam Profiles and Width

Two types of profiles are being displayed;
Sum Profiles-Displays the two orthogonal profiles, one along the vertical axis and one along the horizontal axis. Each profile is composed of a summation of rows and columns at a beam cross-section.



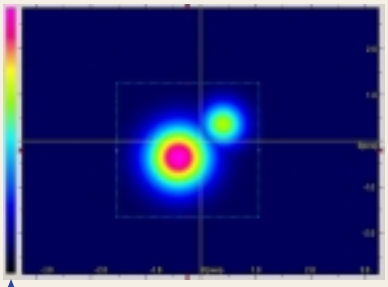
Horizontal Profile

Line Profiles-Displays the beam contour along a line parallel to the vertical and horizontal axes. These two orthogonal lines are designated as a cross hair cursor on the image plane and can be moved along the working area.

Results

Beam widths are digitally displayed for any three user selected clip levels.
A Gaussian fit profile can be overlaid on profiles in real time, while the correlation and fit values are displayed digitally. A Top Hat profile presentation and fit is also available.

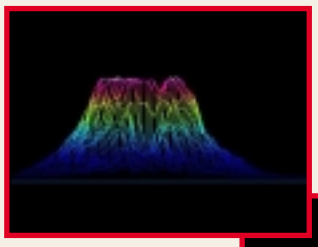
2D and 3D Intensity Plots



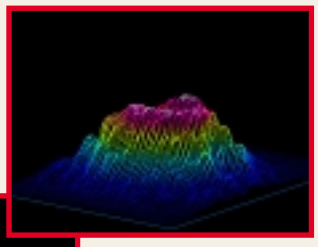
Beam Intensity Pallet

The Projection function provides either a 2D or a 3D plot of the beam intensity profile. A zooming feature enables magnification of the displayed image. It is possible to control the 3D plot wire density. For a weak beam image, even at max shutter and gain settings. Use the beam intensity pallet to optimize color display.

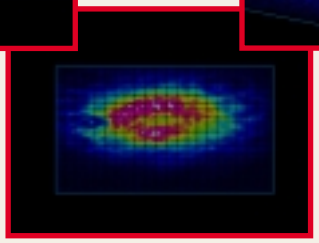
The 3D plot can be rotated along the beam optical axis, as well as be flipped. This feature enables the user to view the image from various angles around the beam.



3D Plot - side view



3D Plot - top view



2D Plot

Power Measurement

The beam power is displayed as a digital readout at the status bar. A power calibration function allows the user enter a “base” power value. In subsequent captured images the summed intensity of all pixels will be proportional to this value.

System Analysis

BeamOn provides an extensive range of laser beam parameters calculation and analysis.

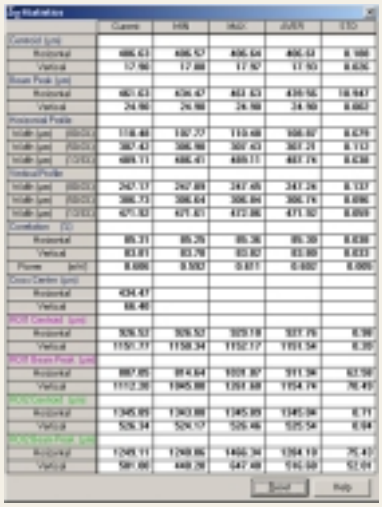
Beam Position

The beam centroid is continuously monitored relative to the center of CCD head. Three Regions of Interest (ROI) can be defined by the user, thus enabling the user to monitor up to 3 beams' centroids simultaneously.

Detailed Statistics

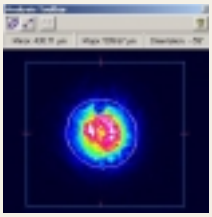
The information in Statistics screen is updated in real time and is useful for analyzing beam characteristics. It lists the information in a table format and shows the actual measurement values, as well as the MIN (minimal measurement), MAX (the maximal measurement), AVER (the averaged value), and STD (the standard deviation) of several parameters which are crucial for beam analysis:

- Centroid (H / V profiles)
- Beam Peak (H / V Proflies)
- Beam width at 3 clip levels (H / V Profiles)
- Correlation to Gausian profile (H / V Profiles)
- Power (mW)

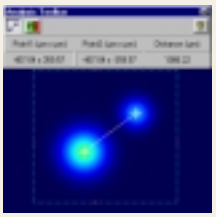


Statistics

Analysis and QA Testing



Elipse estimation



Distance measurement

Test

The software enables a best fit to an elipse as well as direct distance measurement.
The **Elipse function** calculates the best-fit elipsoid for the examined beam. The major and minor axes of the fit elipse are calculated as well as the orientation of the major axes of the fit.
The **Distance measurement function** calculates the distance between any two points on the beam image, the points are being selected by the user.

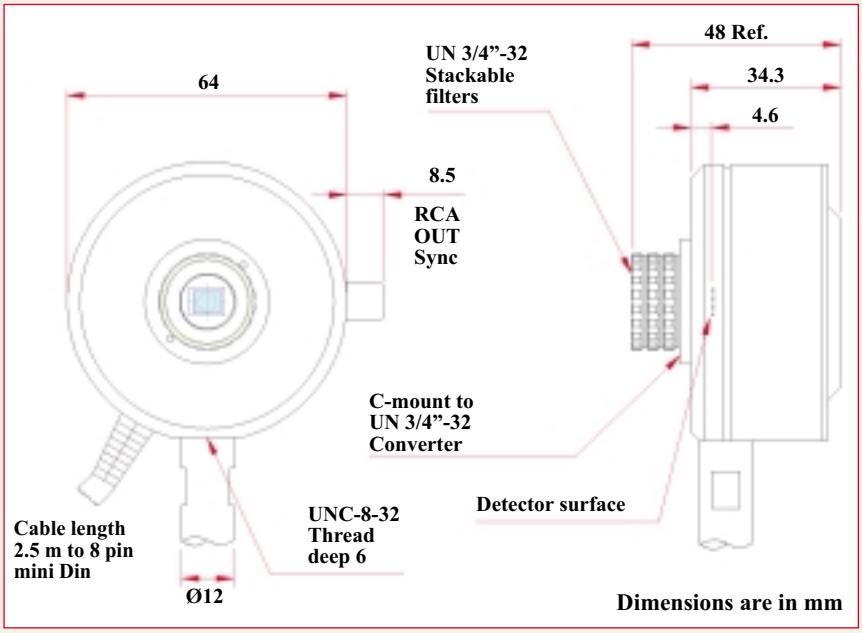
The **Test routine** allows the user to test a laser beam based on user-defined Pass/Fail criteria. The test results are calculated for any one of the beam calculated parameters.

More Software Features

- Data logging to a Text file (up to 99 hours)
- Average
- Zooming
- Printing of text and images
- User set threshold levels
- Full on line Help routine
- Live Snapshot files replay for complete analysis of results
- Capture up to 12 still images
- Setup for different camera types (for PCI version)
- Multiple PCI boards operation (Windows 2000/XP)
- Full session recordings for off-line analysis (Mpeg)
- Customer set Pass/Fail criteria
- Tile images in matrix format
- Direct link to Duma's website for support

Specifications

CCD Head Drawing:



CCD Head Specifications

Camera type:	Monochrome interline transfer CCD •" format
Pixel size:	8.6µm(H)X8.3µm(V)
Sensor active area:	6.47mmX4.83mm
Weight:	295 gr. with cable
Sync out:	RCA female jack, 4.5V square wave TTL output
Power consumption:	5V, 0.9Watts
Accessories included:	3XNG 1.6mm thick Schott colored filters in housing about 240:1 (wavelength dependent), cap, mounting post

General Specifications

PC interface:	1/3 size P&P PCI card or USB2.0 Attachment
RS232:	Data out
Operating temp:	-10°c to 50°c
Storage temp:	-40°c - 60°c
CE compliance	

Ordering Information

The system comes with a camera, a post, a set of 3xNG Schott colored filters (NG4, NG9, NG10) in housing, a PCI card or a USB2.0 Attachment, software on CD disk, carrying case and user manual. Select PC interface when ordering.

	spectral range
BeamOn-VIS (PCI or USB2):	350-1100nm
BeamOn-UV (PCI or USB2):	190-1100nm
BeamOn-IR1310 (PCI or USB2):	350-1310nm
BeamOn-IR1550 (PCI or USB2):	350-1100nm Plus 1550nm±50nm
NG Filter:	1.6mm thick Schott colored filter in mount, select type:4/9/10
BeamOn-Sampler:	Attachment for high power lasers attenuation (up to 20W)

Host Computer Requirements

Pentium III (IV, 1GHz for USB2.0 ver), 128MB RAM, 10MB Free HDD, 16 MB 16 bit color VGA card, resoloution 1024X768, CD ROM any type, 1 free 1/3 size PCI slot (or 1 free High Speed USB2.0 port), OS Win2000/XP (also Win98/Me for PCI ver).

System Performance with Software

System Response

VIS 350-1100nm
UV 190-1100nm
IR1310 350-1310nm
IR1550 350-1100nm and 1550nm (*)

(*) Model IR1550 is based on the standard CCD for VIS which is coated with a conversion coating, enabling capture of signals at the 1550nm range +/-50nm.

Max frame rate:	25Hz
Image resolution:	640X480
Shutter speed:	1/50 to 1/10000 sec, 8 steps
Gain control:	6dB to 30dB, 8 steps
Null:	In CW mode Null function is available to automatically subtract background
Optical dynamic range:	up to $1X10^{11}$ using all filters and software controlled electronic shutter and gain
Damage threshold:	50W/cm² with filters
Sensitivity:	~5nW/cm² at 633 nm (models VIS, UV)
	~15µW/mm² at 1310 nm (model IR 1310)
	~50µW/mm² at 1550 nm (model IR 1550)
Saturation:	~1mW/cm², no filters (models VIS, UV)
	~5mW/cm² no filters (model IR 1550)
Operation with pulsed lasers:	Ability to capture and replay images from slowly pulsing lasers (1-100Hz) while filtering out frames with no laser pulse. Provision for displaying single shot pulses.
Triggering:	In pulsed mode set threshold by slide bar to display frames with captured pulses
Max frequency for single pulse display:	10KHz

DUMA OPTRONICS LTD.

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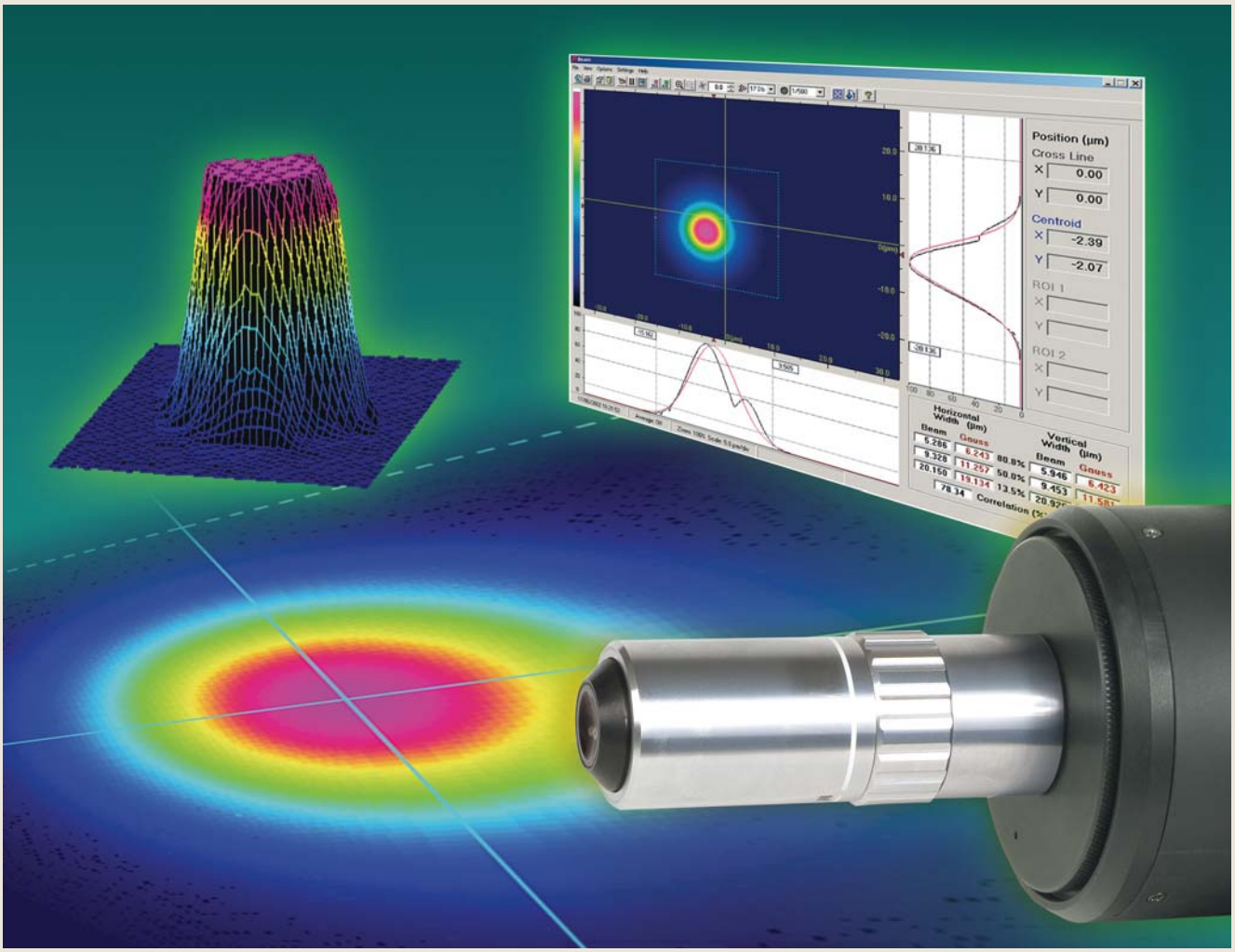
μBeam

The Analyzer for Microscopic beams



- Measures microscopic beams of less than 0.5μm (FWHM)
- Handles CW or pulses at low or high repetition rates
- Measure μW to Watts with included filter
- Long working distance (Objective to object)
- New! High resolution, high responsivity 800,000 pixel CCD readout device
- Wide spectral response range
- User friendly software
- Full Stand Alone instrument, or USB 2.0 interface with powerful software
- Excellent for industry and laboratory
- Optical zooming for fast beam finding
- Excellent for fast focusing

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Main Software Features

- Graphical presentation of a laser beam in 2D/3D.
- Three ROI's (Region of Interest) user-selectable.
- Centroid and beam width profile calculation to sub micron accuracy.
- User adjustable dynamic range by controlling the built-in electronic shutter speed and gain.
- Performs Test analysis
- Measures CW or pulsed beams.
- Real time beam measurements:
  Beam size at 3 clip levels with Gausian fit
  Total intensity (sum profile) along XY axes
  XY profiles selectable by anchor point & rotation
- Real time position measurements
- Data logging with detailed statistics
- Video with playback
- Save / View images, snapshot files
- Digital Zooming
- Full on line instructions and help

Specifications

Camera and Magnification

Camera type	CCD 1/6" format, with approx. 800,000 effective pixels
Spectral Response	350 - 1310nm (For IR range, IR corrected objective is required)
Magnification	Infinite conjugate objective and magnifying lens. Objective magnification is x100; x50 ; x20 ; x10 user selectable. Built-in motorized zooming function.
Beam finding feature	Equipped with a zooming lens for observing large areas. Optical dezooming up to 1/25 from objective magnification.
Attenuation:	Built in NG10 filter (removable)
Configuration	Tube type zooming microscope equipped with M6 mounting thread.
Dimensions:	163.5mm (L) x 83mm diameter (without objective and base)
Weights:	2.56Kg
Lens Working Distance (W.D.):	6mm (for x100), 13mm (for x50), 20mm (for x20), 33.5mm (for x10), parfocal distance 95mm.
USB 2.0 version:	USB 2.0 interface, Windows 2000 / XP (Pentium IV 1.6 GHz)
Stand Alone unit specifications:	Pentium III 800MHz and up, 64MB RAM 2.5" HDD 6GB, Windows 98/Windows 2000 Color VGA card 1024x768 resolution, 2MB RAM One PS2 mouse port, one PS2 keyboard port, One LAN Ethernet port ,One serial port with RS232 One FDD 3.5" ,Two USB ports 100W power supply, AC input voltage: 90 VAC to 264 VAC 4 operating buttons on console for fast access to the following functions: Print, Log, Link, Exit
Stand Alone unit Dimensions	125(W) x 252(H) x 268 (D) mm
Stand Alone unit Weights	5.5Kg
System Performance with Software:	
Minimum measurable beam size	0.5 µm for x100 objective
Maximum frame rate	30Hz (CW lasers)

Ordering Information

Model uBeam-X- USB 2.0 : A complete system based on a measuring head with USB 2.0 interface and Windows 2000/XP application program, select type of objective magnification (X)

X (Objective magnification): x100, or x50, or x20, or x10

Model uBeam-X-SA : A complete system based on a measuring head and stand alone control unit, select type of objective magnification (X)

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M^2 Beam

The M^2 Beam is a versatile multi-function PC based measurement system that provides analytical and graphical capability to measure the 2 axis M^2 figure of merit, waist size and location of CW lasers. The M^2 factor is measured in accordance with the proposed ISO standard ISO/CD 11 146. Additionally, the instrument measures the Profile width, Position and Power of the laser beam at intersection points along the beam propagation axis.

Main Applications:

- Laser printers QC
- Far field alignment of lasers
- Optical systems QC
- Construction of Lasers
- Laser Diode module construction
- Particle measurement

Easy Alignment

The instrument is designed to provide three degrees of freedom for aligning the M^2 Beam to the input beam. Horizontal and vertical axis angles can be adjusted ±1.5° relative to the mounting base. These adjustments along with the visual feedback provided by the beam locating software make the system very easy to align.

User Friendly Software

The M^2 Beam has a special software package for measuring the M^2 parameter.
Main Functions:

- The first screen presents the relative cross axis location of the beam and the beam waist in orthogonal directions along the direction of propagation, where the locations, M^2 values and beam sizes are all displayed digitally after completion of the measurement.
- The second screen is a 3D projection of the beam size along the axis of propagation.
  In either screen, a pointer can be scrolled to a location on the graph and the digital displays will show the values at those points. The software also provides easy file managements capabilities for logging the results for archival purposes.

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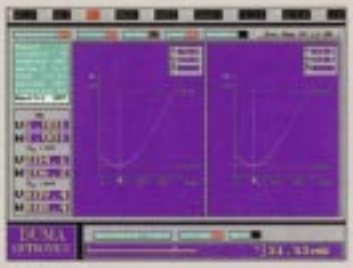
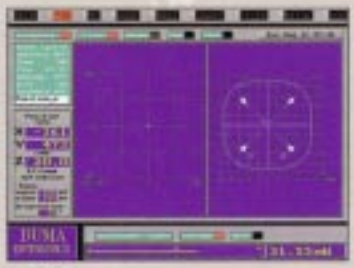
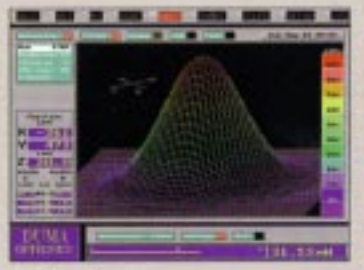
Main Screens



M^2 - 2D



Position



Projection

Profile

System Specifications

Input Beam:

Wavelength Range: 350-1100nm (Si): 800-1800nm (InGaAs) 190-1100nm (UV)

Measurable Power: 100µW-1W with supplied internal filters (NG4&NG9) for the Si version
100 µW-5mW for InGaAs & UV versions

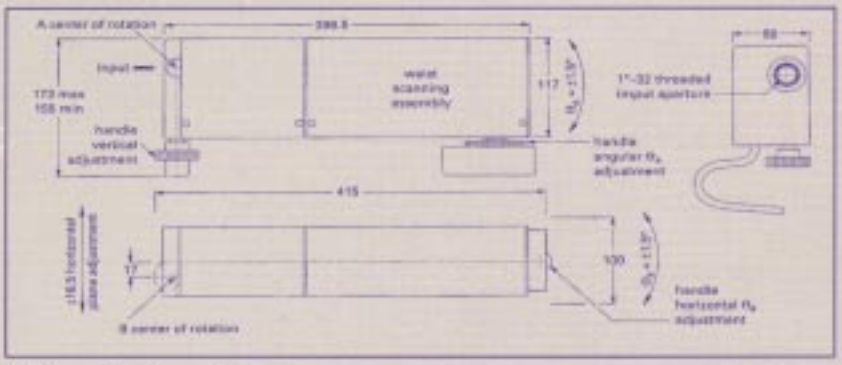
Beam size: 15mm diameter with lens (Si)
7mm diameter without lens (Si)
3mm diameter without lens (InGaAs), or 5mm diameter without lens (InGaAs)

Accuracy

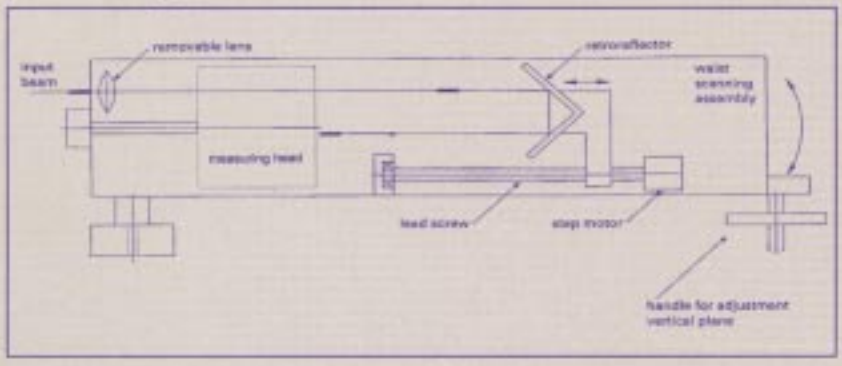
Waist Position as measured at the Transformed Waist:

V Axis: ±50µm **W Axis:** ±50µm
Z Axis: ±50µm **M^2 Value:** ±10%

M^2 Beam outline and mounting



M^2 Beam Configuration



Stand Alone unit specification	
Construction	Heavy - duty steel
Power supply maximum output	60 Watts AC input voltage: 90 to 264 VAC
Input frequency	47 to 63 Hz
Safety standards	Meets UL, CAS, VDE, FCC standards
FDD	Equipped with one 3.5" FDD 1.44MB
Printer port	Standard Parallel port, 25 Pin (LPT2)
Serial ports	One port for RS232 One port for mouse
Super VGA driver	Super VGA ISA board installed, 1MB

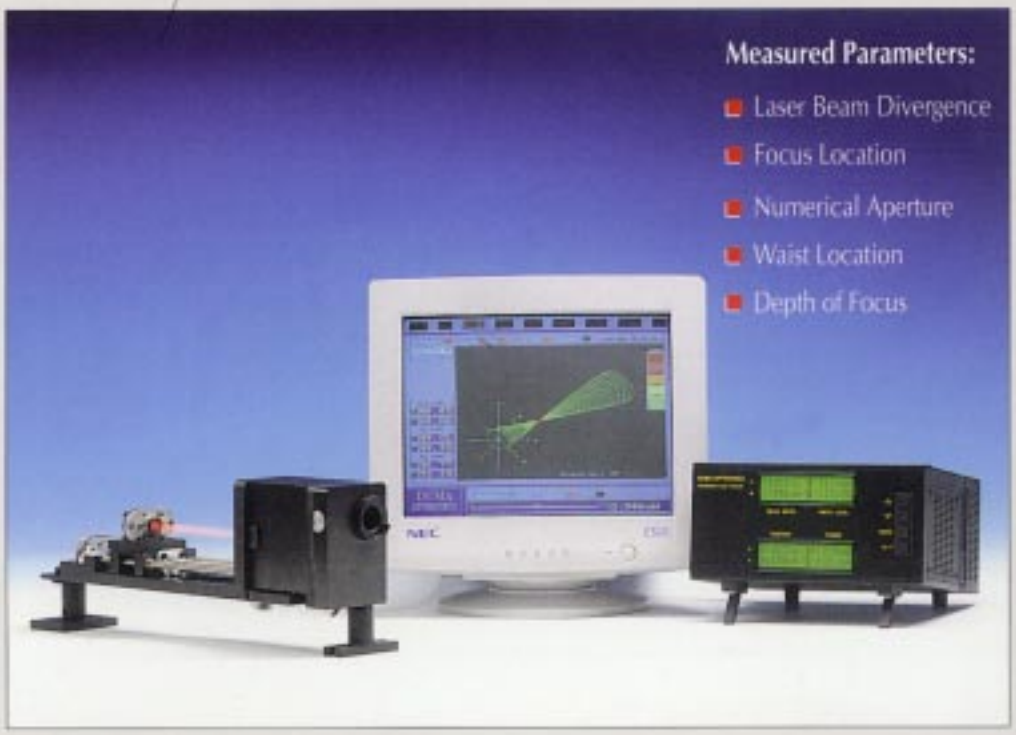
General Information	
Construction Material:	Aluminum
Mounting:	M6 or 1/4" screws
Mechanical adjustment:	Horizontal Angle: ±1.5° Vertical Angle: ±1.5°
Operating Temperature:	10°-35°c
Outline dimensions:	100*173*415mm
Cable:	2.5m long

Models

M2-Beam-SI	7-blades profiler, Si
M2-Beam-IR 3mm	7-blades profiler, InGaAs - 3mm diameter
M2-Beam-IR 5mm	7-blades profiler, InGaAs - 5mm diameter
M2-Beam-UV	7-blades profiler, UV-enhanced

FocusGage

FocusGage is a versatile, multi-function PC based measurement system that provides the analytical and graphical power of the 7-blades Beam Profiler, along with the ability to measure the 2 axis depth of focus, waist size, waist location, divergence (NA) of CW lasers and laser diodes. The depth of focus is measured by scanning the laser beam along its propagation axis and measuring beam size at different locations.



Modular Construction

The basic construction of the FocusGage is a 7-blades beam profiler detector head assembly installed into a Waist Scanning Assembly. As shown in the figure - Option A, the Scanning Assembly consists of a corner cube mounted on a stepper motor driven lead screw that effectively translates the waist of the input beam relative to the detection plane of the beam profiler head. A waist location must be generated within the Scanning Assembly for waist measurements. A second option, Option B, where the corner cube is removed, and replaced with a laser projector, enables direct measurements of the examined laser beam. Option A is a perfect solution for direct measurements of lasers and laser systems that can not be fitted into the Waist Scanning Assembly because of the laser size or measurement needs (such as increased scan length). Option B is a perfect solution for direct measurements of bare diodes or mounted laser diode projectors.

Easy Alignment

The Waist Scanning Assembly is designed to provide four degrees of freedom for aligning the laser to the input beam. Horizontal and vertical axis angles can be adjusted ±1.5° relative to the mounting base. The Horizontal axis plane can be translated ±10mm and the vertical location can be adjusted ±3mm relative to the mounting base.

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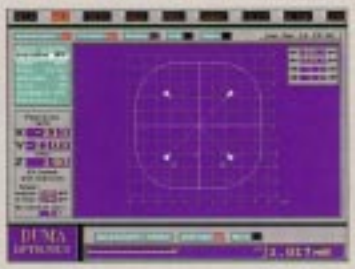
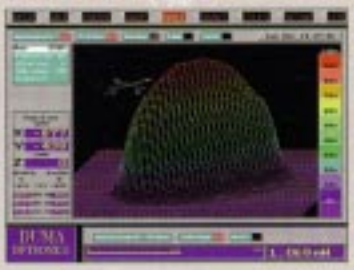
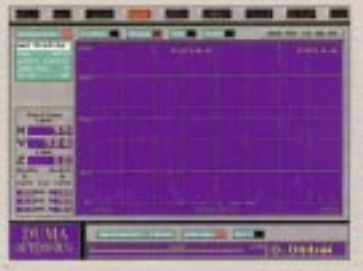
Main Screens



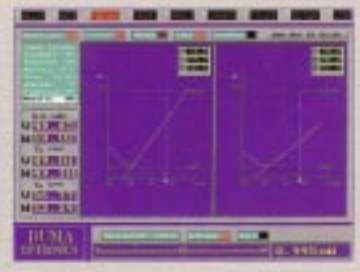
Adjust



3D



Profile



Focus

System Specifications

Input Beam:

Wavelength Range: 350-1100nm (Si): or 800-1800nm (InGaAs) or 190-1100nm (UV)
Measurable Power: 10µW-1W(*) (*with supplied ND filters for the Si version)
10µW-5mW For InGaAs & UV versions
Maximal Beam size: Si & UV: 9mm diameter, 12.7mm for elliptical beams
InGaAs: 3mm diameter, or 5mm diameter

Scan Parameters for the corner cube (Option A):

Minimum distance from Input Aperture to measuring area: 230mm
Minimum Step Size: 100µm
Selectable Profile Locations: 0-140 Scan length: 280mm

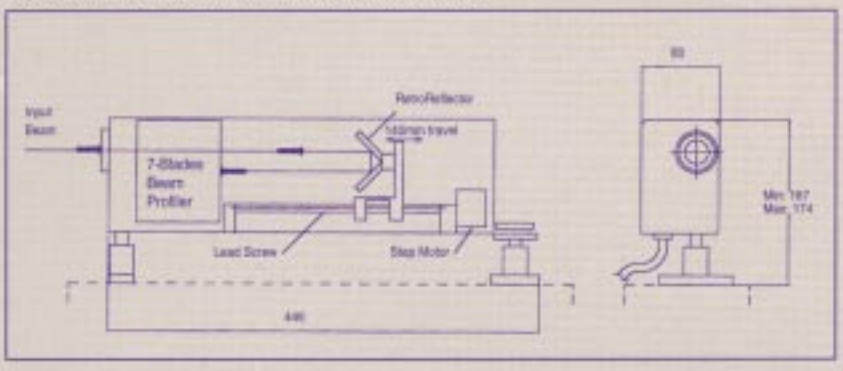
Scan Parameters for direct coupling (Option B):

Length of scan: 140mm Waist position: ±50µm
All axes resolution: down to 1%

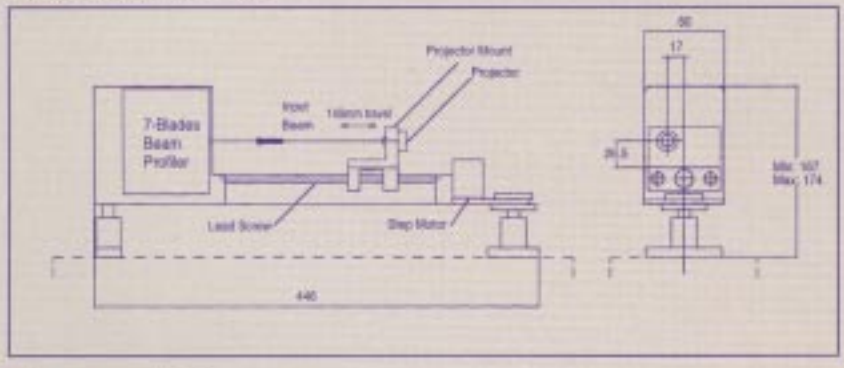
Accuracy

Depth of focus accuracy: ±50µm Resolution down to 10µm

Option A: Moving Retro-Reflector, fixed source



Option B: Moving source



Stand Alone unit specification	
Construction	Heavy - duty steel
Power supply maximum output	60 Watts AC input voltage: 90 to 264 VAC
Input frequency	47 to 63 Hz
Safety standards	Meets UL, CAS, VDE , FCC standards
FDD	Equipped with one 3.5" FDD 1.44MB
Printer port	Standard Parallel port, 25 Pin (LPT2)
Serial ports	One port for RS232, One port for mouse
Super VGA driver	Super VGA ISA board installed, 1MB

General Information	
Construction Material:	Aluminum
Mounting:	M6 or 1/4" screws
Mechanical adjustment:	Horizontal Angle: ±1.5° Vertical Angle: ±1.5°
Scanning Assy dimensions:	100x173x415mm, 2.5kg
SA unit dimensions:	248x122x215mm, 4.5kg
Cable:	2.5m long, 0.5kg

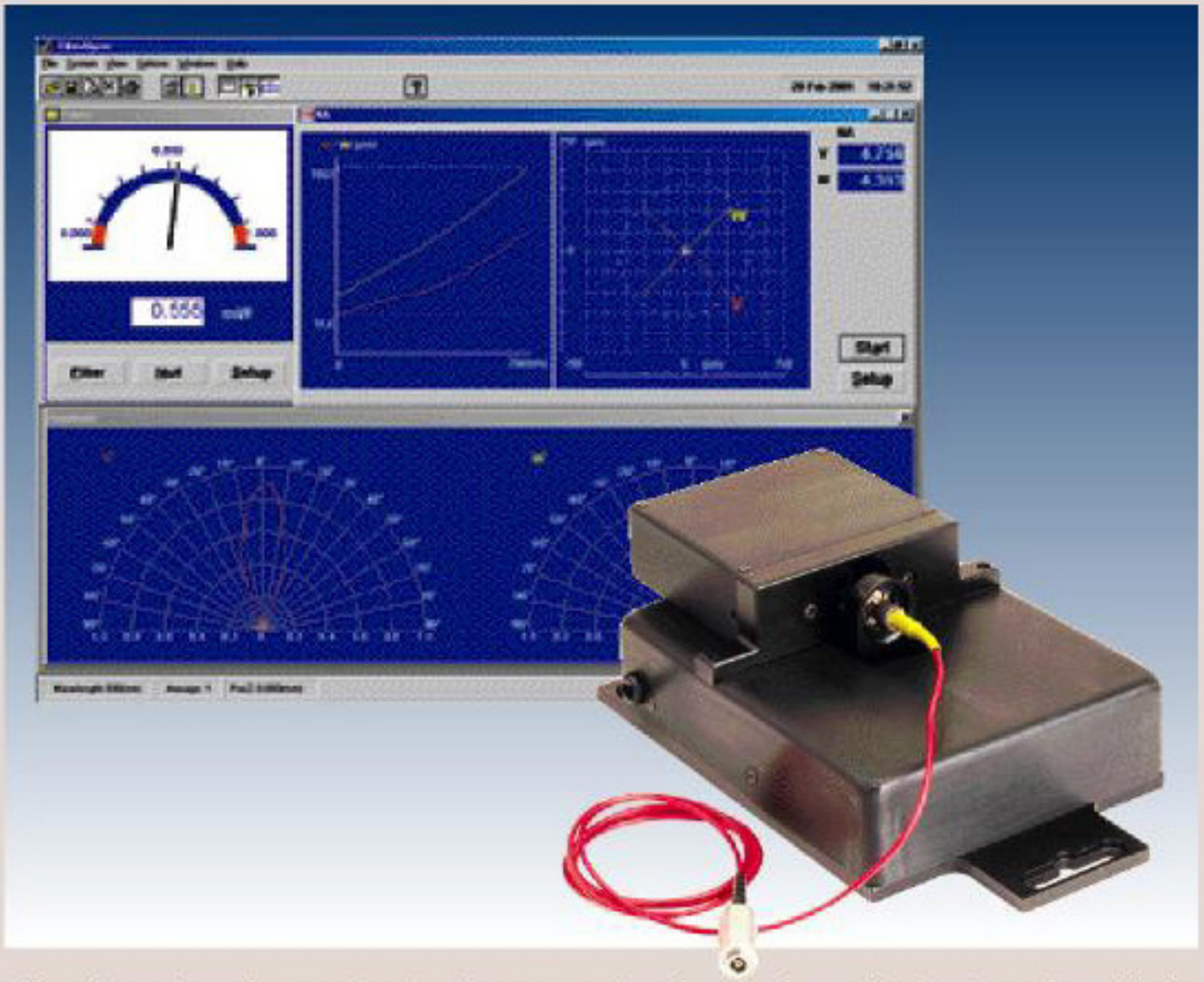
Models

FG-Si: FocusGage Si version
FG-InGaAs - 3mm: FocusGage InGaAs 3mm
FG-InGaAs - 5mm: FocusGage InGaAs 5 mm
FG-UV: FocusGage UV-enhanced version

*** All models can be supplied with either option A or option B configurations.**

FiberAlyzer

Goniometric Radiometer for fiber/diode analysis



FiberAlyzer is a characterization instrument for the angular radiation intensity of light. The device provides real-time far-field measurements over a 60° angular field.

Features

- Measures Numerical Aperture
- Measures Angular width ratio
- Measures Angular position with respect to the optical axis
- Measures power

Main Applications

- Fiber optic far-field angular radiation
- Laser diode/Led far-field angular radiation
- Collimation measurements
- Coupling of energy into fiber

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Specifications

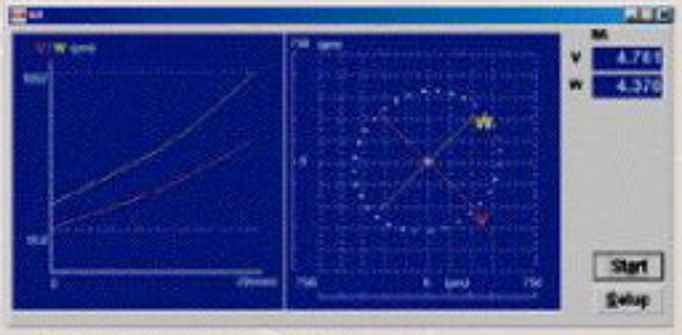
Spectral response	300-1100nm or 800-1800nm
Detector type	Si or InGaAs
Connector type	Receptacles to various fiber optic connectors and adaptors for laser diodes
Measuring range	60° (±30°)
Angle accuracy	±1%
Spatial Resolution	±0.05°
Scan unit weight	2.5kg
Scan unit dimensions	229x147x85mm

Software Features

Power

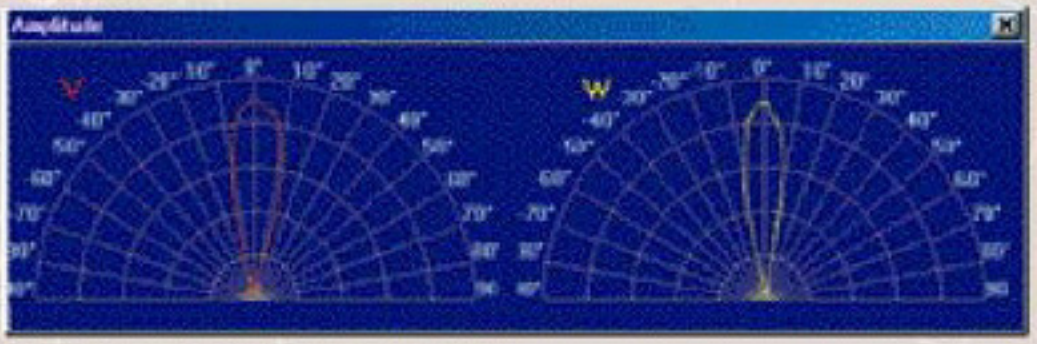
Real time power measurement

NA Measurement



Real-time N.A. measurement and monitoring of angular position in two axes

Goniometer



Real-time display of angular propagation in two axes

Ordering Information

Complete System containing: Stand alone operating console, scan unit, attachments for fiber optic or laser diode, software package installed on console unit.

FyberAlyzer - InGaAs: System based on InGaAs detector

FyberAlyzer-Si: System based on Si detector

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